

1 **CLAIMS**

2

3 1. One or more protected digital objects embodied on one or more

4 computer-readable media, individual digital objects being embedded with at least

5 one fingerprinting word produced in accordance with a method comprising:

6 defining a plurality of fingerprinting words, each fingerprinting word being

7 unique and containing at least one spread sequence; and

8 assigning individual fingerprinting words to individual respective entities,

9 the fingerprinting words serving to identify an entity to which it is assigned;

10 said fingerprinting words being structured to permit a collusion analysis to

11 ascertain identities of potential colluders who change an associated fingerprinting

12 word.

13

14 2. The one or more protected digital objects of claim 1, wherein each

15 fingerprinting word contains a plurality of spread sequences.

16

17 3. The one or more protected digital objects of claim 1, wherein the

18 defining of the plurality of the fingerprinting words comprises selecting a length

19 for the fingerprinting words, the length being a function of a number of colluders

20 that are desired to be defended against and an error rate  $\epsilon$ .

21

22

23

24

25

1           4.     The one or more protected digital objects of claim 1, wherein each  
2     fingerprinting word contains a plurality of  $\Gamma$ -symbols, each  $\Gamma$ -symbol containing  
3      $2c-1$  spread sequences, where  $c$  is the number of colluders that are desired to be  
4     defended against.

5  
6           5.     The one or more protected digital objects of claim 1, wherein at least  
7     one digital object comprises a document.

8  
9           6.     The one or more protected digital objects of claim 1, wherein at least  
10    one digital object comprises a video object.

11  
12          7.     The one or more protected digital objects of claim 1, wherein at least  
13    one digital object comprises a music object.

14  
15          8.     One or more protected digital objects embodied on one or more  
16    computer-readable media and produced in accordance with a method comprising:

17           defining a plurality of fingerprinting words, each fingerprinting word being  
18    unique and containing at least one spread sequence, wherein each fingerprinting  
19    word contains a plurality of  $\Gamma$ -symbols, each  $\Gamma$ -symbol containing  $2c-1$  spread  
20    sequences, where  $c$  is the number of colluders that are desired to be defended  
21    against, said fingerprinting words being structured to permit a collusion analysis to  
22    ascertain identities of potential colluders who change an associated fingerprinting  
23    word;

1 assigning individual fingerprinting words to individual respective entities  
2 who constitute potential colluders, the fingerprinting words serving to identify an  
3 entity to which it is assigned; and

4 embedding at least one fingerprinting word in at least one digital object.

5  
6 **9.** The one or more protected digital objects of claim 8, wherein at least  
7 one digital object comprises a document.

8  
9 **10.** The one or more protected digital objects of claim 8, wherein at  
10 least one digital object comprises a music object.

11  
12 **11.** The one or more protected digital objects of claim 8, wherein at  
13 least one digital object comprises a video object.

14  
15 **12.** A  $\Gamma$ -code data structure configured for use in an embedding process  
16 for protecting digital data, the  $\Gamma$ -code data structure comprising:

17 a memory;

18 a plurality of spread sequences in the memory, the spread sequences being  
19 arranged in blocks that are combinable to define fingerprinting words that are  
20 assignable to individual entities to which protected objects are to be distributed;  
21 and

22 said fingerprinting words being structured to permit a collusion analysis to  
23 ascertain identities of potential colluders who change an associated fingerprinting  
24 word.

1           13.    The  $\Gamma$ -code data structure of claim 12, wherein the blocks are  
2 combinable to define individual  $\Gamma$ -symbols, each  $\Gamma$ -symbol comprising  $2c-1$   
3 blocks, where  $c$  is the number of colluders that are desired to be defended against.

4  
5           14.    One or more protected objects comprising:  
6 digital data embodied on one or more computer-readable media; and  
7 a fingerprinting word embedded in the digital data, the fingerprinting word  
8 containing at least one spread sequence, the fingerprinting word being associated  
9 with an entity to which the object is to be, or has been distributed;  
10 said fingerprinting word being structured to permit a collusion analysis to  
11 ascertain one or more identities of potential colluders who change the  
12 fingerprinting word.

13  
14           15.    The one or more protected objects of claim 14, wherein the  
15 fingerprinting word contains a plurality of  $\Gamma$ -symbols, each  $\Gamma$ -symbol containing  
16 at least one spread sequence.

17  
18           16.    The one or more protected objects of claim 15, wherein each  $\Gamma$ -  
19 symbol contains a plurality of spread sequences.

20  
21           17.    The one or more protected objects of claim 16, wherein each  
22 fingerprinting word contains the same number of  $\Gamma$ -symbols.

1           **18.**    The one or more protected objects of claim 16, wherein each  $\Gamma$ -  
2 symbol contains  $2c-1$  spread sequences, where  $c$  is the number of colluders that  
3 are desired to be defended against.

4  
5           **19.**    The one or more protected objects of claim 14, wherein at least one  
6 object comprises a document.

7  
8           **20.**    The one or more protected objects of claim 14, wherein at least one  
9 object comprises a music object.

10  
11          **21.**    The one or more protected objects of claim 14, wherein at least one  
12 object comprises a video object.

13  
14          **22.**    One or more computing devices embodying the one or more  
15 protected objects of claim 14.